Online and Virtual Schooling in Europe

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Abstract

The development of interactive online technology has enabled the development of online and virtual schools in Europe, North America and elsewhere. These forms of school education challenge conventional schooling modes characterised by the physical presence of teachers and students in a building using experiential modes of learning. This paper considers examples of online projects for European school students. It also discusses the reasons for the development of online and virtual schools, and differentiates between available choices. Some of the key issues associated with virtual schools are explored, including flexibility, reaction to industrial modes of schooling, socialization, students' suitability for online environments, teacher training and professional development, the emergence of new educational paradigms, and the reduction of empathy between teacher and student. The paper concludes that virtual schools are likely to become increasingly attractive for school students and parents in Europe, but their characteristics may vary from those in other countries. A consequence of the growth of virtual schools is that there is likely to be an increased focus on the advantages and issues associated with interactive online learning.

Keywords

Interactive computer learning, virtual schools, online learning, e-learning.

Topics of this Paper

Introduction: the challenge and opportunity of interactive online learning for European schools

The continued growth of global interconnectivity has enabled Europeans to supplement face-to-face interactivity with its mediated, online counterpart. Increasingly, daily life provides numerous examples including banking, travel, higher education, shopping, services and commerce, where people can choose a virtual environment if they wish. However, not all areas of society have developed online alternatives at the same rate. In school education, Leadbetter (2005) argues that in the UK, traditional secondary schools based on a factory model remain as a striking exception to the process of virtualisation that is becoming commonplace elsewhere:

> Our vast secondary schools are among the last great Fordist institutions, where people in large numbers go at the same time, to work in the same place, to a centrally devised schedule announced by the sound of a bell. In most of the rest of the economy people work at different times, in different places, often remotely and through networked organisations. In the last two decades private sector organisations have become more porous, management hierarchies have flattened, working practices have become more flexible, job descriptions more open and relationships between organisations, as suppliers and partners, more intense. The bounded, stand alone school, as a factory of learning, will become a glaring anomaly in this organisational landscape (p.7).

Leadbetter's observation prompts two important questions about school education in Europe. Has the importance of online education been recognised, and what has been the nature of the responses to it?

There is little doubt that at the level of the European Commission the importance of online education has been recognized in a number of policy documents. *The e-Learning Action Plan - Designing Tomorrow's Education*, (European Commission 2000) observed that

> The effectiveness of education systems depends entirely on the effectiveness of the approaches to teaching and learning. In order to be effective, the introduction of information and communication technologies will have to be accompanied by a far-reaching reorganisation of learning structures (p.2).

More recently, the European Commission also observed that "E-learning is starting to become mainstream in our education and training systems" (2003, p.13). These comments are particularly relevant to school education, where students and teachers have access to a complex online learning environment that can be used at school, home or elsewhere. In this environment, students can construct their own understandings of the world, with a reduced emphasis on earlier didactic models of learning involving the one-way transmission of information.

Online computers enable students to overcome geographic and temporal boundaries. In conventional classes, they enable students to access vast amounts of information, work constructively with others in more remote parts of the world, and respond to lessons and course materials that have been placed on intranets or the Internet. They also make it possible to introduce radical forms of schooling, including

classes in conventional schools that are heavily reliant on the web, virtual schools, and web-based home schooling

The diversity of online learning alternatives for schools

Table 1, below, outlines a classification of online alternatives for schools in terms of approaches based conventional schools, virtual schools and home schools.

Table 1. online learning alternatives

Schooling variant	Teacher location	Primary teaching mode
Conventional school based	school	face-to-face
Virtual school	Remote locations	mediated
Home school	home	face-to-face

Online resources for conventional schools

The *conventional school* is likely to be the most common way in which online learning is used in European schools. In this schooling mode, students physically meet with their teachers in a dedicated building or classroom where online facilities are available, although some additional work may be completed at home. *Resources* are often available online from a provider, vendor or umbrella organisation. In Europe, one of the key providers is European Schoolnet, an international association of ministries of education from Europe and elsewhere. European Schoolnet provides a portal for members that includes a number of innovative projects for schools, in addition to policy information and online services. The European Schoolnet (EUN) describe their operations as follows:

> The European Schoolnet is a unique international partnership of 26 Ministries of Education developing learning for schools, teachers and pupils across Europe and beyond. We provide insight into the use of ICT (information and communications technology) in Europe for policy-makers and education professionals. This goal is achieved through communication and information exchange at all levels of school education using innovative technologies, and by acting as a gateway to national and regional school networks (European Schoolnet 2005).

Examples of current and recent projects include:

- Netd@ys Europe: An initiative promoting the use of new media (multimedia, Internet, videoconference or new audio-visual facilities) in the area of education and culture culminating in a showcase of online and offline events. Recent developments have focused on the quality and educational content of associated ventures and promotion of partnerships between educational and cultural organisations
- myEurope: A safe web-based project designed to raise children's awareness of European issues, via innovative class activities and school projects
- Celebrate - a project based on what electronic content may look like in the future. The project includes the provision of an online database that will include learning objects for education
- Xplora - a gateway for science education for teachers, students, scientists, and others, containing activities, resources, tools and community links
- Spring Day in Europe - project in which schools learn about EU developments and incorporate them into the curriculum. It emphasises cooperation, communication, and the sharing of ideas between teachers and schools across Europe,

Another example of an online resource is the ATW Virtual School (2005). This is a web site provided by the Association of Teachers Websites that provides a range of online lessons for a number of subjects.

Virtual Schools

Virtual schools can be understood as a variant of distance education whereby students use online computers for some or even or all of their schooling, and where there is spatial and sometimes temporal separation between students and their teachers. One example of a virtual school is "out-of-school" model, where students work from home with an online computer to complete a course of study, and teachers interact with students from a distance. Such schools are more common in North America, where the Florida High School in the USA, which has adopted the motto of "Any Time, Any Place, Any Pace" (Johnston 2004), and where there are no school buildings for students to attend.. There are also many combinations of conventional and virtual schools components, or hybrids of bricks-and-mortar and online learning modes. In some cases, students spend much of their time working at home, but meet at school for sport, social activities, and practical classes. An additional variation can be identified in Queensland, Australia, where the Virtual Schooling Service (VSS 2005) relies principally on synchronous interaction in the timetabled classes of conventional schools.

In Europe, the number of virtual schools is comparatively small, and, as with virtual schools elsewhere in the world, they are at times difficult to identify. The term "virtual school" is used loosely by educators. At times it can refer to an individual school that is showcasing its students' achievements by constructing web pages containing their work. A component within European Schoolnet, entitled *virtual school* has recently concluded, and has been replaced by other projects. Another variation in the UK, (Virtual School 2005) is a joint development between the National College for School Leadership, the BBC and the Centre for Educational Leadership in Manchester. This is a scenario-based simulation for teachers and leaders within schools that aims to introduce leadership issues within a computer-generated school environment.

Several virtual schools (or virtual schooling services) in the UK are specifically designed to assist disadvantaged school-age students. Notschool.net (2005) in the UK is an online research project that aims to re-engage school-age students into learning who have previously been out of more traditional educational systems. The project aims to establish a virtual community and develop students' self-esteem through the use of new technology and community support. Similarly, the Liverpool Virtual School, which was the first virtual school in the UK when it opened two years ago, is an online school that gives students from deprived areas of Liverpool access to their own computers and e-learning packages. This distance

learning programme operates in conjunction with regular school attendance. Another recent addition to virtual schools of this type is the Old Library Centre Virtual School at West Norwood, Lambeth, in the UK. This new virtual school intends to provide an elementary education, using the Internet, for pupils in years 9, 10, and 11 who do not have a mainstream school place.

Additional virtual school or virtual school services available in Europe include:

- AustriaVirtual School (2005). The Austria Virtual School is a subject-oriented resource providing online educational information for Austrian students and teachers. The school works in close association with European School Network
- Kennisnet (2005) - The Netherlands Virtual School.
- Finland Virtual School (2005). The national virtual school project in Finland is based on local, regional and national projects. Students can take their qualifications and courses as distance learning.
- VSG Enrichment (2005) Formerly known as the Virtual School for the Gifted, VSG enrichment is an online school which specializes in providing enrichment courses to complement and extend the regular curriculum. This school uses an Australian internet address but offers services to many parts of the world. It isn't tied to the curriculum of any particular country.
- ORT Aviv Virtual School. This was Israel's first virtual school. It has operated since 1997. It offers a program of nearly 40 online courses and operates in 36 schools in Israel

Home Schooling and ICT

Home schooling involves students being taught at home by one of their parents. This option is increasingly becoming possible because of the connectivity of online technology. Parents now have access to a wealth of educational materials, lesson plans and even complete courses, and they are less dependent on teachers, dedicated school buildings and educational bureaucracies. However, as home schooling is private, it is difficult to measure. As Nilsson (2004) points out, it is difficult to measure and controversial in some areas. Across Europe, it is likely that some countries will be more open to the possibilities of home schooling than others will.

The nature of European Virtual Schools

Just as the term "virtual school" can be misleading, a school can operate as a virtual school but can be referred to by terms including online school, e-learning, digital school, electronic school, and distance education centre. An example of this last terminology is in Canada, where the Fraser Valley Distance Education Centre, offers online classes to students living in more remote parts of British Columbia.

In addition, it can be difficult to research the nature of virtual schools in Europe, because of linguistic fragmentation, restricted entry to school sites, and a lack of independent evaluations. The first factor, linguistic fragmentation, refers to the diversity of languages and even alphabets used on related web pages. As much of the analysis must depend on the virtual school's internet presence, an understanding of their nature requires considerable understanding of the appropriate language. Virtual school sites can also assume knowledge of a country's educational system, curriculum, politics and culture. The restricted entry to some virtual school sites is understandable, as educators would not want random web surfers browsing through confidential sections of their web sites. However, a consequence is that it can be difficult to proceed further than the public-relation oriented front page of the site. A final concern is that of publicly available independent evaluations and reports on virtual schools are still uncommon in Europe. Although this was also true of virtual schools in the USA. in the early days, there has recently been a trend towards greater transparency and accountability. Reports available into virtual schools in the USA. include the Virtual High School or VHS (Kozma et. al 2000) and the Florida High School Evaluation (2002).

Reasons for the development of virtual and online schools

Some of the principal factors that might explain the growth of virtual schools in the early years of the twenty-first century include globalization, economic rationalism, models provided by higher education, concerns about traditional schools and vested interests, and the availability of interactive computer technology.

School education today is part of a global system where there is the power to communicate instantaneously across national borders. This capability is changing our understanding of the world around us. One implication of this change is that nation-states, educational authorities and individuals are faced with the momentum of globalisation. There are strong forces operating that encourage students to use global online networks from their homes, to attend school less frequently than in earlier times, or even not to attend a conventional school at all

Economic rationalism also drives the adoption of virtual schools because the enabling online technology continues to be a critical factor in the global economy. Economic rationalism implies that there are efficiencies to be obtained by the deregulation and commercialisation of traditional modes of operation, and that, as Rutherford (1993) argues, the collective or government provision of goods and services is a disincentive to private provision. Smith and Sachs (1995) maintain that there are global trends which put a premium on productivity, efficient use of resources and value for money. There are several aspects relating to the establishment and maintenance of virtual schools that are attractive to economic rationalists. These include the savings expected from infrastructure costs when there is a reduced need for dedicated school buildings and equipment, and the opportunity to purchase courses of study and websites from vendors rather than develop them in-house. When students access a virtual school from their home computer, the savings anticipated from not having to provide school buildings and contingent services can be offset against the cost of courses of study and IT maintenance

While the idea of an online school will still seem radical to some students and parents, there are many examples in daily life where there are parallel face-to-face and online options, including higher education. It is likely that as online computers become common in our daily lives that our perceptions of the world will be correspondingly altered. The ways that people interact with online environments, and the purposes for which they are to be used are shaped, are shaped by the experiences that they provide. With the example of higher education, it has become increasingly common for adults to study online. Indeed, Dunn (2000) argues that virtual universities will become the predominant mode of higher education by 2025, and that some conventional colleges and universities in the USA will have to close because they are unable to compete with the online competition. The consequence of this trend is that many households with school-aged students will include adults who have completed qualifications online. This provides a modelling effect for students.

A factor related to the modelling effect provided by examples of family members and friends using the Internet for higher education is that as the Internet becomes routine in people's lives it also becomes more important. As the number of people using the Internet increases there is a greater chance that the information that students require will be easily available, or that they will be able to interact online with a range of people. Netscape founder Marc Andreeson cites Metcalfe's Law as following:

> The power of the network is N squared, where N is the number of nodes. So if you double the number of nodes, you actually double squared or you quadruple the overall value of the network. The reason is that the network gets more valuable to me if you come on it. Even though I'm already there, the network's getting continually more valuable to me as more people come on, as more contact comes on, as important businesses are connected. (Segaller 1998, p.283)

Developments that challenge conventional school education based on experiential learning become more likely as the network grows more extensive. Online learning is one example of a dramatic shift in the society of industrialized countries whereby online computers are used for a range of functions, and often without the necessity of physically visiting places where there is face-to-face interaction. Mitchell (2000) has described the ways that our concept of going to traditional places is being challenged by their digital counterparts, and observed that

> Once, we had to go places to do things; we went to work, we went home, we went to the theatre, we went to conferences, we went to the local bar-and sometimes we just went out. Now...high capacity digital networks... deliver information whenever and wherever we want it. These allow us to do many things without going anywhere. So the old gathering places no longer attract us. Organizations fragment and disperse. (p.4)

Virtual and online schools can also be an attractive option when traditional schools are seen as unsafe or inappropriate. In the USA there are examples where students are afraid to go to school because they are worried about being hurt or even shot by classmates (Elliott, Hamburg and Williams 1998), high schools in New York City where violence is normalized (Devine 1996), or the toleration of exclusionary practices, abuse, and discriminatory policies (Epp 1996). In addition, parents may be reluctant to send their children to traditional schools if they have philosophical or religious objections to the curriculum and pedagogy, or if they believe that the school does not support their values. Although adoption of online schooling on the grounds that existing schools are unsafe is unlikely to be a major factor in most European countries, those who are interested in home schooling may be attracted to the wealth of information available on the World Wide Web.

Non-traditional schools based on the Internet can also be introduced because it is in the interests of those who promote them. Just as conventional schools provide employment for teachers, administrators, and related services including cleaning and maintenance, virtual and electronic schools can be profitable or provide employment to entrepreneurs, educators and others. A range of web-based businesses sell online courses or IT solutions for this purpose. In other cases, establishing a successful online school can be seen as beneficial to the careers of those who have been critical of conventional education.

Key issues of virtual schooling

Virtual schools face challenges associated with their characteristic flexibility. There are also issues related to the reaction to industrial modes of schooling, socialization, students' suitability for online environments, teacher training and professional development, the emergence of new educational paradigms, and the reduction of empathy between teachers and students.

Flexibility has been seen as a great advantage of virtual schools. Depending on the type of virtual school, there is a reduced dependence on geographical place and freedom from the restraints of timetables. In some cases, students are able to work from home with an online computer. However, schools have traditionally had a custodial function for those students who are in the compulsory years of schooling. Students in this age group who study primarily from their homes will need to have parents or guardians who are also flexible in their employment or household duties. Some parents may be attracted to the "out-of-school" model of virtual school but may be unable to support it because they still need to go to work to earn a living. Despite this concern, there will be some students in the post-compulsory years of schooling who are likely to appreciate the flexibility provided by virtual schooling. For some, it can mean that they can work at a part-time job during the day and catch up with their studies during the evenings. In other cases, students can continue to study at a conventional school, and use a virtual high school for those subjects which are either not offered at their school, or are unavailable because of timetabling problems.

Traditional schools have often been criticised for not teaching the skills required by the 21st century economy. Although there are differences between countries and school systems, many schools retain characteristics of an earlier mechanical age where factories were part of the way of life for many. Examples of these characteristics include uniforms, bells, timetables, lock-step progression through the system, mass production, learning programs and modules, basic competencies, and directly experiential rather than mediated modes of operation. Although we are now in the post-industrial period, schools have in many cases been slow to change. As Beare (2001) suggests, schools now have to face the influence of the market economy, and are sometimes seen more as private businesses with greater responsibility. In the schools of the 21st century, there is likely to be a reduction in centralisation, and a changing role for principals, teachers, and others. Crump (1999) has described traditional schools as yesterday's schools, while Bentley (2000) argues that persistent and unpredictable changes in economy, demographics, technology, culture, values and relationships throws doubt upon the institutions we have created to deliver education. Virtual schools may be one answer to this dilemma, but radical changes to an educational system that has been widely accepted for many years are unlikely to be welcomed by many.

Students will learn the norms and values of society by interacting with people, artifacts and representations in a variety of contexts, including schools. It has long been accepted in industrialised societies that schools have a function in promoting positive attitudes towards humanistic values, democracy, respect for others and citizenship. With traditional schools, these principles are often reinforced by face-to-face relationships between students and teachers, and between students, in combination with institutionalized procedures such as assemblies and awards. Virtual schools, in contrast, promote the use of interactive technologies that destabilise institutional contexts. Traditional modes of socialisation, including those fostered by schools and families, are challenged by the increased mobility of technologies such as online computers and mobile phones. The sense of identity, belonging, culture, and the value systems used to negotiate relationships with others are increasingly linked to globalized interactive contexts. Virtual schools enable students to access online communities and interact with others. While there is clearly socialisation in both face-to-face and online schools, it is unclear whether one mode is preferable to another. In modern and

post-modern cultures, schools have played an important role in socialising students. They have often competed with families, communities and institutions as agents for instilling cultural norms. For this reason, the introduction of virtual schools may be slowed because parents and communities are reluctant to make the change to online socialisation of students. Claeys, Lowyck and Van der Perre (1997) have reported an interview with an ICT expert, who noted that

> schools and teachers will not disappear regarding education of young children because they have a function that goes beyond transferring knowledge, there are values, norms, socialisation to be communicated. (p.146)

The problem of socialisation in virtual schools is related to the proportion of experiential or unmediated interactions available. Some variants of virtual schools provide regular opportunities for face-to-face learning and involvement in social situations. Examples include extra-curricular activities, field trips, science classes, and sports.

A particular concern related to student socialisation in virtual schools is that the web culture characteristic of these schools may be inherently isolating. This claim is supported by Putnam (1995), who has argued that technology is associated with diminished civic engagement and social connectedness. Nevertheless, although there is a possibility that the continued growth of virtual schools will exacerbate a perceived existing trend towards loss of community, the related research is inconclusive. For example, one study of Internet use (Kraut et. al. 1998) found negative effects relating to participants' communication with family members on the household and increased depression and loneliness, while research by Katz and Aspden (1997) found no basis for pessimism regarding community involvement. Arguably, much of the existing research is also inappropriate, either because the individual students are adults, who differ from typical virtual school students, or because issues such as long term effects of socialisation are not able to be readily assessed.

A related concern to the question of socialisation and virtual schools is the question of how effective these schools are in the teaching of values and attitudes. One writer (Inglis 2001) has argued that online teaching is more suitable for achieving cognitive than affective objectives. However, there has been little recent research in this area that is directly relevant to students in virtual schools.

Students' suitability for online environments is also an issue. It is a truism to assert that not all students will be successful at a conventional school. Students' characteristics are also likely to be one of the factors related to success in face-to-face learning environments. In research related to one virtual school, Del Litke (1998) has reported that self-motivation, persistence, intelligence and supportive parents were important factors in students' success. Some virtual schools offer online questionnaires for students, asking them about their independent learning abilities, motivation, and time management skills. This is particularly the case in the out-of-school model of virtual schooling described previously in this paper, where students needed the discipline to meet deadlines and manage their own learning.

The characteristics of virtual schools are particularly important when considering whether students are likely to succeed in this environment. This is because student support is a vital consideration, and this in turn can take the form of support structures in bricks-and-mortar schools, parents, teachers, and interactive online assistance. The nature of the required support is likely to cover a range of needs including subject assistance, counselling, time management, and assistance with information technology and online procedures used by the school.

The increased adoption of virtual schools will also lead to a reconsideration of the skills that teachers will need. It is likely that some new skills will be needed, and that some traditional skills in face-to-face class classrooms will become less important. For example, teacher practices that involve maintaining discipline and on-task behaviour through direct unmediated observation and interaction of students will be less important in out-of-school models of virtual schools. However, this does not mean a deskilling of teachers as there will be a corresponding increase in teachers' abilities to moderate online discussion groups, and understand screen-based interactions.

The requirement for new skills in interactive online environments will lead to an increased demand for them to be taught, either in pre-service teacher education courses, or as part of professional development. Because virtual schools constitute only a very small proportion of schooling available throughout the world, even in North America, there has been little modification by teachers' colleges and other providers of teacher education to existing courses, although teacher trainees will increasingly use online methods for some component of their courses. Concern that insufficient progress has been made in the area of teacher training and new technologies is reflected in the findings of the European Commission (2000):

> Lack of appropriate training for teachers and trainers is a major obstacle to the use of new technologies in education. Moves to train teachers or trainers in use of the new tools have not always been reflected in any significant progress in teaching practices (p.12).

Training, instead, is more likely to involve professional development. The California Virtual School Report (2002) reports the use of online modules for teachers at Durham Virtual High School, in Canada, a 15-week teacher training program in Fairfax County School District, and professional development options at Virtual High School. There is also a mentoring program operating at Florida Virtual School, and Erlbaum, McIntyre, and Smith, (2002) outline a 26 week online course which trains secondary teachers in online teaching practices and prepares them to design and deliver their own online course.

Virtual schools represent a new educational paradigm, in which the shift from experiential learning with classrooms and teachers is eventually subsumed by its mediated online counterpart. The understanding, in Europe and elsewhere, that students should collectively attend a designated place, where they would be taught by trained teachers, has its origins in notions of universal education from the nineteenth and twentieth centuries. In Thomas Kuhn's (1970) work, *The Structure of Scientific Revolutions,* paradigms are seen as examples of practice, and these examples provide models from which particular traditions are derived. While the conventional understandings of school education are such a paradigm, it is possible for new practices to emerge that will eventually challenge them. In this case, virtualisation is not an isolated process confined to schooling. There has been a dramatic societal shift in industrialized countries whereby online computers are used for a range of activities including school education. While it is most unlikely that conventional schools will disappear, it is however likely that the shift away from the use of direct experience will continue. This may take several forms, including teachers' use of online materials in conventional schools, including those provided by the resource variant of virtual schools, or more radical forms of virtual schools that require little or no attendance at conventional schools with teachers.

An additional concern with virtual schools is that they promote a form of learning where fewer information channels are used to transmit information than in a corresponding face-to-face class. Russell (2005)

argues that because the cues emanating from physical settings are missing in online contexts, insufficient attention is paid to questions of the teachers' empathy for students and the affective domain. In contrast, the bandwidth available in conventional classes allows for the transmission of cues related to body language, and social and relational cues. The consequence of the reduction of these cues in Virtual Schooling contexts is that much of the information relating to the emotional and psychological states of teachers and learners is lost or misunderstood.

Future developments of Virtual Schools in Europe

If the number and type of European virtual schools are compared to those of North America and other areas, some differences can be expected. This is because virtual schools are an innovation that is emerging because of a perceived political, social or educational need (Russell and Russell 2001). The form that more mature virtual schools will take in a particular country is largely determined by the environments that they serve. For Levinson (1997), inventors' inventions differ from what is eventually produced because of the social environments in which they are to operate. The European Commission (2003) has observed that

> The use of technology in classrooms is found to be socially contextualised, interacting with the institutional and organisational cultures of schools and reflecting elements of the prevailing social relations in and around the context of use. Research demonstrates that educational organisations are social organisations that both influence the ways in which an innovation will be adopted and are influenced by that innovation. (p.4)

Conclusion

Online and virtual schools are likely to become increasingly attractive for school students and parents in Europe. As e-learning becomes commonplace, and the enabling online technologies increase flexibility for learners, the delivery of course materials and even much of a student's education over the Internet will be routine. However, because of social, cultural and historical differences, the characteristics of future virtual schools in Europe may differ from those that are currently operating in other parts of the world. A consequence of the growth of virtual schools is that they enable communities to reflect on the advantages and challenges associated with interactive online learning.

Acknowledgement

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